FIVE- YEAR REVIEW REPORT

KIN- BUC LANDFILL SUPERFUND SITE

EDISON TOWNSHIP, MIDDLESEX COUNTY, NEW JERSEY

Prepared by:
U. S. Environmental Protection Agency
Region II
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February 1999

U. S. Environmental Protection Agency
Region II
Emergency and Remedial Response Division
Five- Year Review (Type lA)

Kin- Buc Landfill Superfund Site
Edison Township, Middlesex County, New Jersey

I. Introduction

Authority Statement. Purpose. The U. S. Environmental Protection Agency (EP A) Region II connducted this statutory five-year review pursuant to Section 121(c) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), Section 300.430 (t) (4) (ii) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) and OSWER Directives 9355.7- 02 (1991), 9355.7- 02A (1994) and 9355.7- 03A (1995). The purpose of a five-year review is to ensure that a remedial action remains protective of public health and the environment and is functioning as designed. This document will become part of the Site's Administrative Record file. This review (Type IA) is applicable to sites at which remedial action activities are ongoing.

Remedial actions are not complete at the Site. The remedial action for Operable Unit I (OU I), commenced on August 23, 1993. This remedial action has been completed and is documented in Final Reports, dated June 18, 1996 and May 9, 1997. The remedial action for Operable Unit II (OU II) commenced on September 12, 1994 and was documented in the Final Report dated January 29, 1996. However, during the construction of the OU I remedy, buried drums were detected in Mound B, an area not previously thought to be used for hazardous waste disposal. Consequently, EPA has initiated further investigation and remediation of Mound B.

Site Characteristics. Landfilling began at the Site in about 1947, (although it was not until 1968 that Kin- Buc, Inc. began operating the Site) including municipal, industrial, and hazardous waste. Between 1971 and July 1976, Kin- Buc, Inc. operated the Site as a state- approved landfill for industrial (solid and liquid) and municipal wastes. Hazardous wastes were disposed in the main landfill mound, Kin- Buc I, as well as in Kin- Buc II. However, in 1976, the New Jersey Department of Environmental Protection (NillEP) revoked Kin- Buc's permit to operate because of violations of both state and federal environmental statutes. EPA's involvement with the Site began in 1976 during investigation of an oil spill at the Site which revealed discharge of hazardous substances from the facility. EP A filed initial charges against the owner- operators in 1979, under such statutes as the Water Pollution Control Act, and the Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act (RCRA). Under a 1980 partial settlement, Kin- Buc, Inc. (and not the other defendants) agreed to install a landfill cap and initiate a long- term monitoring program, but not to remediate the Site or control the further migration of contaminants in the area. Therefore, in 1980, EP A began cleanup activities under Section 311 (k) of the Clean Water Act, I.: collecting aqueous and oily leachate from the Pool C area for treatment and disposal.

In 1981, the Site was added to the National Priorities List (NPL). In September 1982, Kin- Buc, Inc. assumed the removal operation at the Pool C area that EP A had been conducting since February 1980. In addition, EP A attempted negotiations for performance of the remedial investigation/ feasibility study (RI/ FS) with Kin- Buc, Inc. based on a proposed CERCLA § 106 Consent Order. Negotiations were unsuccessful and led to issuance of a Unilateral Administrative Order (Findings of Fact, Determination and Order Docket No: II- CERCLA- 30102) against the 11 initial defendants of the 1979 civil action on

September 23, 1983.

In May 1984, a draft RI/FS was submitted to EPA by the owners and operators ofKin- Buc. On- March 25, 1986, EPA issued an amended Unilateral Administrative Order (Findings of Fact, Determination, and Amended Order Docket No: II-CERCLA- 60105). The purpose of this order was to " update" the 1983 Order by requiring the owners and operators to follow guidance that had been established during the interim period on the conduct of an RlIFS. The revised draft RI was submitted in April 1988 and the draft FS was submitted in May 1988.

On the basis of the RI/FS, a remedy for the Site was selected in a Record of Decision (ROD) signed on September 30, 1988. The ROD divided the Site into two remedial phases known as operable units: OU I consists of the Kin- Buc I and II mounds, as well as portions of the Low-Lying Area and Pool C, while OU II included adjacent areas impacted by contaminant migration from the landfill, that is, Mound B, the Low- Lying Area, Edmonds Creek, Mill Brook/ Martins Creek, and the wetlands associated with Edmonds Creek.

The au I selected remedy was intended to provide source control for the landfill mounds and included: maintenance and upgrading of the Kin- Buc I cap, and installation of a RCRA Subtitle C cap on the remainder of the source area, consisting ofKin- Buc II, the Pool C area, and portions of the low- lying area between Kin- Buc I, the Edison Landfill and Pool C; installation of a circumferential slurry wall to bedrock on all sides of the source area; collection and off- site incineration of oily phase leachate; collection and on- site treatment of aqueous phase leachate and groundwater from within the slurry wall, in order to ensure the integrity of the slurry wall containment system, with discharge of treated water to the Raritan River; landfill gas extraction and flare system; periodic monitoring; operation and maintenance; and, an additional RI/FS to determine the nature and extent of off-site contamination associated with the Site (OU II).

The OU II RI/ FS was conducted by the owner/ operators under amendments to the initial Unilateral Administrative Order issued in 1990. This investigation focused on evaluating the nature and extent of: groundwater contamination in the Low- Lying Area and Mound B; wetlands contamination in the Edmonds Creek/ Marsh system; and surface- water contamination in Edmonds Creek and Mill Brook/ Martins Creek. The OU II RI/ FS and Proposed Plan were released to the public for comment on July 15, 1992.

The OU II ROD was issued on September 28, 1992. The major components of the remedy selected in the OU II ROD are: the excavation of sediments, from the Edmonds Creek wetlands, contaminated with polychlorinated biphenyl (PCB) levels that exceed the remedial action objective of 5 parts per million (ppm) total PCBs; disposal and containment of the excavated sediment within the au I slurry wall and cap; active restoration of excavated wetlands in the Edmonds Creek Marsh, as well as mitigation of impacts caused by remedial activities; long- term monitoring of groundwater underlying Mound B and the Low-Lying Area (both believed to contain refuse), surface water in Edmonds Creek, and the Raritan River adjacent to Mound B; and maintenance of the clay cover over Mound B.

II. Discussion of Remedial Objectives; Areas of Noncompliance

The primary objectives of the 1988 and 1992 RODs are to control the source of contamination at the Site, to mitigate any off-site impacts resulting from migration of contaminants, and to minimize any potential human health and ecological impacts resulting from exposure to contamination at the Site. To evaluate. the effectiveness of the remedial actions, a long-term monitoring program was designed. The long- teml monitoring program, which started in January 1996, included, for OU I, the

installation of wells on either side of the slurry wall to monitor water quality with elevations in the three different hydrogeologic units (refuse, sand and gravel, and bedrock), plus the monitoring of off- site gas migration in those areas where gas migration or accumulation could cause potential problems. The OU II groundwater and surface water network also provided for water quality monitoring in the three water- bearing zones. In addition, wetlands monitoring (for OU I and OU II) along with biota monitoring (for OU II) are also part of the remedy.

Groundwater/ Surface Water Monitoring and Landfill Gas Monitoring

Once a year, all monitoring wells, as well as surface water locations, are tested for volatiles, semi-volatiles, pesticides/ PCBs, dissolved metals, and landfill leachate indicator parameters (pH, BOD, COD, turbidity, etc.). During the other three quarters, only some of the dissolved metals and leachate parameters are tested. However, gas monitoring wells are tested quarterly through the whole year for percent combustible gas per volume (%GAS) and percent lower explosive limit (%LEL).

The monitoring to date shows that concentrations of conventional leachate indicator parameters are present at levels expected for a refuse unit. Other constituents, such as sodium, sulfate, and chloride, are present at levels consistent with an estuarine environment, which is present at the Site. In addition, constituents such as total organic carbon, phenolic compounds, and nitrogen are present in the groundwater due to the inherently high organic content of the meadow mat existent beneath the refuse layer. In general, there are no trends in the water quality data which would indicate that the remedy is not protective.

In February 1998, and after reviewing eight quarters of monitoring data, EPA agreed to the PRP's petition for changing the frequency of the groundwater and surface water monitoring program (from a quarterly to an annual basis) along with changes to the parameter list, including monitoring of groundwater geochemical parameters (i. e., dissolved oxygen, iron (II), oxidation-reduction potential). This was a result of evaluating the appropriateness of the existing monitoring program for detecting changes in water quality attributable to th~ completion of major components of the selected remedies for both operable units. The addition of the groundwater geochemical parameters to the monitoring program was necessary to adequately assess the long- term changes (trends) in the chemistry of groundwater in and around the landfill. By measuring these long- term changes, documentation and quantitative evaluation of the importance of natural attenuation at the Site are possible.

Landfill gas monitoring shows that combustible gas levels in the landfill remain at acceptable levels. However, on February 16, 1998 a grass fire took place on the Kin-Buc I mound; it was extinguished that same day. However, the next morning the area was smoldering again, which led to the investigation and later discovery of a subsurface oxidation condition within the landfill. As a result of the subsurface oxidation, part of the landfill cap and gas collection system collapsed. On February 18th. the fire was quenched by covering the exposed fill area with soil. Presently, cap repairs have been completed. Reseeding is expected to be completed in spring 1999.

As a result of the recent fire in the Kin- Buc I mound, EPA called for a revision (to be included in an overall revision of the Operation and Maintenance manual) of the landfill gas monitoring plan to ensure that monthly readings of percent methane and pressure are included in the quarterly reports that are submitted to EP A. In addition, it appears that better monitoring of temperatures may be necessary. The PRPs have agreed to improve their monitoring so as to minimize the probability of recurrence of fires at the Site.

Leachate Treatment Plant Monitoring

Aqueous leachate (from the refuse zone) and groundwater (from the meadow mat) are extracted from several well locations and pumped to the leachate treatment plant where it is treated to meet effluent limitations before discharging to the Raritan River. Waste oil (non-aqueous leachate) is not treated but is hauled off-site for disposal.

The analytical results of samples of the effluent from the leachate treatment plant are reported in monthly Discharge Monitoring Reports. A review of three years of these reports showed, in general terms, compliance with the effluent limitations as established in the New Jersey Pollutant Discharge Elimination System Permit Equivalent. Whenever the effluent exhibited elevated results for any parameter, an investigation was conducted and corrective actions were taken. In most instances, these results were due to recording mistakes, laboratory error, or equipment failure.

Wetlands Monitoring

The OU I remedial action involved the disruption of approximately 3.56 acres of tidal wetlands. The tidal mitigation work involved enhancement of approximately 11 acres of wetland. Site inspections are to be conducted on a semi- annual basis in the spring and fall growing seasons for a period of five seasons. Inspections began in May 1998 and are currently scheduled to continue until the year 2001. A goal of 85 percent coverage of the mitigation area with desirable tidal wetland plant species is used as a benchmark for mitigation success.

The OU I wetlands restoration is progressing. The initial May 1998 monitoring event identified baseline conditions in the OU I tidal mitigation area following completion of mitigation area preparation in April 1998. Natural recolonization of the area has started. Recolonization appears to be slightly impeded by dead Phragmites debris left as a result of herbicide application and cutting activities performed to control Phragmites.

The OU II remedial action involved the disruption of wetlands in the Edmonds Creek Marsh. The mitigation workplan calls for the planting of cordgrass in an attempt to restore the affected wetland community to pre- remedial action conditions. Site inspections are to be conducted on a semi-annual basis in the spring and fall growing seasons for a period of three years and annually for the fourth and fifth years. Inspections began in July 1996.

The OU II wetlands restoration has not been successful to date. EP A is concerned about the propagation of undesired species (primarily Phragmites) over the species planted in. the area. Based on recommendations from its Biological Technical Assistance Group (BT AG), EP A has recently notified the PRPs of its concern and requested that the PRPs consider the use of herbicide in the au II wetlands restoration area. EP A will continue to monitor this situation.

Biota Monitoring

The objectives of the biota monitoring study were: 1) to verify that the clean-up goal of 5 ppm PCBs in the sediments was met (by the collection of sediments from remediated and unremediated zones and from a reference area); 2) to assess the degree of biological uptake of residual PCBs (by analyzing tissue samples from two species collected from the marsh, fiddler crab and mummichog, and from a laboratory bioaccumulation study with a third species, bentnose macoma); and 3) to monitor the re-establishment of the benthic community in remediated areas (by means of a quantitative benthic community survey and a qualitative fish survey).

To date, the results obtained for the biota monitoring program to date do not support the conclusion that biotic/ abiotic recovery from PCBs is occurring in Edmonds Creek. While the final two years of monitoring data may show some improvement in the tissue residue levels, currently it appears that tissue residue concentrations of total PCBs may not be trending downward, and may not currently be at levels that can be demonstrated to be protective of the environment. Nevertheless, these problems may be a consequence of unrecorded variability between unremediated, remediated, and reference zones, heterogeneous sediments, construction/ remedial activity, the presence of a continuing source of PCBs, downstream deposition, or interlaboratory variability. EP A will continue to monitor this situation during the last two years of scheduled biota monitoring. If results do not show improvement, EP A will determine what additional remedial actions are necessary to ensure that the remedy is protective of human health and the environment.

Mound B

During excavation activities associated with installation of the outfall line for the OU I leachate treatment plant, a small number of buried drums were discovered in Mound B, an area adjacen to the Raritan River which was not previously thought to be used for hazardous waste disposal. This prompted the EPA to conduct an investigation of Mound B. In June 1997, groundwater and subsurface soil samples were analyzed for both organics and inorganics. In six sample locations, clean-up criteria for arsenic were exceeded. However, since all were estimated values, this phase of the investigation was inconclusive.

In November 1997, several pits were excavated; buried drums, in various conditions, were found. None of the samples from the pits showed concentrations above State soil clean- up criteria. However, several samples from some of the recovered drums resulted in values of benzene, toluene, and total xylene above State clean- up criteria.

In January 1998, a geophysical survey of Mound B was conducted. In May, based on the geophysical survey results, 14 exploratory trenches were dug in nine distinct anomalies, and 13 drum waste samples were collected. Results indicate that Mound B contains hazardous substances which could serve as a continuing source of contaminants to groundwater and ultimately to the Raritan River. As a result, EP A or the PRPs will perfonn a removal action in Mound B. The removal action will include: excavation of previously identified areas of drummed hazardous waste including removal of associated soils; installation of additional groundwater monitoring wells downgradient of Mound B; repair of the clay cap over Mound B; and, shoreline improvements along the Raritan River.

III. Recommendations

EPA has conducted a statutory Type IA review. Remedial actions have been taken a~ the Site. Site visits of au I and II are erformed at the Site by the EP A Project Manager at a minimum of once each quarter. These visits are complemented by nspections performed as part of the monitoring of the au I and au II wetlands restorations plans and the au II biota monitoring study. In addition, quarterly monitoring reports and monthly discharge monitoring reports are reviewed.

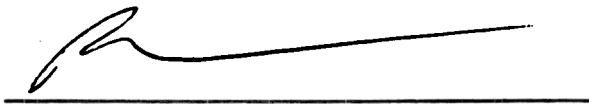
The second operable unit remedy was intended to address the environmental effects of contaminated sediments in the Edmonds reek/ Marsh System. The primary goal of this remedy was to reduce the risk to human health and the environment caused by the uptake of contaminants from sediment into the aquatic food chain. It is not evident that the selected remedy is protective of the environment. EP A will make a final determination after reviewing additional biota monitoring data. In addition, additional remediation is warranted in the Mound B area. This work will be performed by EP A or the PRPs.

IV. Statement of Protectiveness

It is not evident at this time that the selected remedies at this site are protective of human health and the environment. EP A is taking steps to make the remedy protective.

I. Next Five- Year Review

The next five- year review will be conducted by February, 2004.



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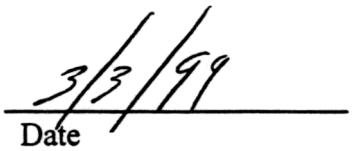

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